

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of Shane Elwart et al.

Application No.: 10/767,339

GAU: 1793

Filed: January 28, 2004

Examiner: Edward M. Johnson

Titled: SYSTEM AND METHOD FOR REMOVING HYDROGEN SULFIDE FROM  
AN EMISSIONS STREAM

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Commissioner for Patents

P.O. Box 1450

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**REPLY BRIEF**

In response to the Examiner's Answer mailed September 25, 2009, Applicants hereby submit this Reply Brief.

Please charge any cost incurred in the filing of this Reply Brief, along with any other costs, to Deposit Account No. 06-1510.

**CERTIFICATE OF MAILING**

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/Caitlin Fackrell/

Caitlin Fackrell

Respectfully submitted,

ALLEMAN HALL MCCOY RUSSELL &  
TUTTLE LLP

/John D. Russell/

John D. Russell

Registration No. 47,048

Customer No. 36865

Attorney/Agent for Applicants/Assignee

806 S.W. Broadway, Suite 600

Portland, Oregon 97205

Telephone: (503) 459-4141

Facsimile: (503) 459-4142

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**I. STATUS OF CLAIMS**

All pending claims have been finally rejected. All pending claims are under appeal.

## **II. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

The final Office action sets forth two grounds for rejection under 35 U.S.C. §103, each of which is to be reviewed on appeal.

- A) 2. Claims 1-3, 5-7, 10, 12, 16-18, 21, 24-27, 29, 31-33, and 36-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bartley et al. US 6,482,377.
- B) 3. Claims 4, 8-9, 11, 13-15, 19-20, 22-23, 28, 30, and 34-35, are rejected under 35 U.S.C. 103(a) as being unpatentable over Bartley '377 as applied to claims 1, 16, 21, and 31, above, and further in view of Li US 6,419,890.

### **III. ARGUMENT**

The Examiner's Answer raises several new issues which are addressed in this Response.

**A. Regarding Claims 1 and 16, the Answer raises the issues of “switching” the air-fuel ratio and specifying an “amount or direction” of air-fuel ratio change, even though they have never been argued by the Examiner or Applicants previously.**

For the first time in the prosecution of this application the Examiner raises the issue of “switching” from lean to rich. *See, e.g.,* pages 5, 6, and 7 of the Answer. Applicants are confused by the Examiner's assertions and arguments, as they appear to miss the entire point of Applicants' arguments in the Appeal brief. Specifically, Applicants pointed out that even assuming the cited art were modified to adjust the air-fuel ratio as suggested by the Examiner, there is still no variation in the duration of a lean or rich air-fuel ratio based on exhaust temperature. Contrary to the Examiner's assertion, Applicants have never argued that the claims require switching.

As noted, Applicants have repeatedly stated that even assuming Bartley et al. shows lean and rich operation, or even adjustment of lean or rich operation, it still fails to adjust the duration of lean and/or rich operation based on exhaust temperature as required by claim 1.

Also for the first time, the Answer raises the issue that the claims do not specify any particular amount or direction of change based on temperature. *See, e.g.,* page 6. This is a red herring, as the prior art still must show some variation of a lean or rich duration based on temperature. The prior art fails to show any adjustment of any parameter based on temperature, and fails to provide any suggestion that the duration of lean/rich operation should be adjusted based on any parameter whatsoever, let alone temperature. Thus, the fact that the claims do not specify an amount or direction of change is irrelevant.

**B. Regarding Claims 1 and 6, the Answer improperly equates “adjusting” an air-fuel ratio with varying the duration of a lean or rich operation.**

At page 6 of the Answer, the Examiner asserts that “to ‘adjust’ the air-fuel ratio ... would by definition vary the duration of a lean or rich ... operation once the adjustment [sic] were made...” First, no evidence is cited to support this new conclusion, and it appears to be based on the Examiner’s personal opinion, not evidence of record. Second, Applicants submit that there are numerous ways to adjust air-fuel ratio without varying the duration of a lean or rich operation. For example, lean operation may be adjusted more lean or less lean without varying a duration of the lean operation. Likewise, rich operation may be adjusted more rich or less rich without varying a duration of the lean operation. Both of these variations would “adjust” the air-fuel ratio.

As such, this illustrates that the Examiner’s conclusions are contrary to logic and not supported by any evidence of record.

**C. Regarding Claim 5, the Examiner improperly contends at pages 10-12 that Applicants’ argument is based on precluding an intermediate compound.**

The Answer appears to place significant weight on the fact that the claims do not preclude certain intermediate compounds. As with other new issues raised in the Answer, this misses the point. Applicants have never contended that the claims preclude intermediate compounds, such as sulfur dioxide (SO<sub>2</sub>). Rather, Applicants have asserted that the specific reactions are not shown.

Further, the Answer appears to intimate that the cited art shows eventually forming the claimed product (in the case of claim 5, a nickel sulfate). However, the Examiner ignores the fact that the step showing formation of a sulfate (MSO<sub>4</sub>/MSO<sub>3</sub>) (step 34 of Fig. 3), occurs

**BEFORE** the formation of the sulfur dioxide (SO<sub>2</sub>) at step 58. As such, even assuming the Examiner's point regarding intervening substances was relevant, SO<sub>2</sub> could not possibly be an intervening substance since it is not formed until after the sulfate is formed.

This illustrates the fact that the new reasoning set forth in the Answer is based on a clear misinterpretation of the claims, the prior art, and general chemistry.

Finally, the general reference to Col. 6, lines 3-23 and specifically 20-23 is clearly insufficient to support a rejection of the specific reaction in claim 5.

**D. Regarding Claim 10, the Answer cites new disclosure which refutes the Examiner's own position.**

The Answer now attempts to show that the reaction of claim 10 is shown in the Abstract. However, the general reference in the Abstract clearly fails to show the claimed elements, as it states that "a reducing agent ... aids in reducing metal sulfates and metal sulfites ... to hydrogen sulfides." There is no mention of reacting a nickel sulfate with a reductant to produce sulfur dioxide to regenerate the nickel oxide.

In fact, the disclosure cited by the Examiner matches steps 44 and 46, which Applicants cited in the appeal brief refuting the Examiner's position.

**E. Remaining new arguments.**

The Answer contains various additional new arguments not discussed here that are clearly improper. As such, no response should be necessary.

**F. Conclusion.**

Applicants have reviewed the entire Answer and still cannot find an assertion that adjusting of a lean/rich duration based on exhaust temperature is obvious. As such, the rejection is *prima facie* improper.

Applicants wish to reiterate that claim 1 specifies:

adjusting an air-fuel ratio of the emissions stream based on exhaust temperature of an emission control device, where said adjustment varies a duration of at least one of lean and rich operation to perform said adsorbing and reacting even as exhaust temperature varies.

Applicants have reviewed all of the rejections and the Answer and still fail to identify any assertion or allegation that evidence of record shows or suggests adjusting a lean or rich duration based on temperature, or that modification of any evidence of record would show such a feature. Further, it is undisputed that Bartley et al. fails to adjust any parameter based on temperature, and further fails to adjust any lean/rich duration based on temperature. And finally, there is no evidence of record that adding such an element would be obvious.